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16. Abstract (MAXIMUM 200 WORDS)

Analytical procedures that can be used to do a sensitivity analysis of a cost estimate, and to perform tradeoffs to identify input values that can reduce the total cost of a project, are described in the report. A problem that has been developed in Project Analysis and Cost Estimating PACE (the Coast Guard's cost analysis system) is used as an example for the procedures. The total project cost is approximated using a model from economics, the Cobb-Douglas function. A procedure is then developed using techniques from economics and calculus to produce the total differential, the estimated change in project cost. This approach is accurate for linear cost models and can be made accurate for non-linear models by simply adding higher order terms to the differential. A procedure is also described for estimating the parameters of the Cobb-Douglas model from data from historical cost estimates. The Cobb-Douglas model can still be used to assess the effects of small changes in parameter values on the total cost even when model parameters cannot be estimated with high precision because historical data is limited.

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